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Novel approach to automatically classify rat social behavior using a video tracking system.

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Abstract

Background: In the past, studies in behavioral neuroscience and drug development have relied on simple and quick readout parameters of animal behavior to assess treatment efficacy or to understand underlying brain mechanisms. The predominant use of classical behavioral tests has been repeatedly criticized during the last decades because of their poor reproducibility, poor translational value and the limited explanatory power in functional terms.

New Method: We present a new method to monitor social behavior of rats using automated video tracking. The velocity of moving and the distance between two rats were plotted in frequency distributions. In addition, behavior was manually annotated and related to the automatically obtained parameters for a validated interpretation.

Results: Inter-individual distance in combination with velocity of movement provided specific behavioral classes, such as moving with high velocity when “in contact” or “in proximity”. Human observations showed that these classes coincide with following (chasing) behavior. In addition, when animals are “in contact”, but at low velocity, behaviors such as